

WO 2004/058013

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FOLDABLE CLOTHES HANGERDESCRIPTION

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Technical Field

This invention relates to foldable clothes hangers particularly but not exclusively to clothes hangers to support and preserve the original shape and body of garments of different neck sizes, the folded position of the hanger conveniently enabling the user to insert the arms of the hanger into the neck of the garment and be opened so that the garment can be hanged easily and effectively.

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Background

Current clothes hangers are, in some ways, inflexible and not user-friendly with garments that vary in neck span sizes, in particular. Although such hangers are well known, they can be difficult to use with T-shirts, pullovers, children clothes or any other kind of garment having a smaller neck span size. Foldable clothes hangers have been proposed with a view to overcoming the problem, e.g. the clothes hangers described in GB-1526867, WO-01/21048, DE-19680605, FR-2773449, JP-10 032326S, US-6149038 and US 4524890, but each of these appears likely to suffer disadvantages.

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It is considered desirable to provide a foldable clothes hanger which can overcome these and/or other disadvantages.

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Summary of the Invention

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According to this invention there is provided a foldable clothes hanger comprising two foldable arms mounted pivotably on a common axis, each arm having a part provided with a toothed arcuate rack engaging a pinion that is mounted pivotally on an adjacent parallel axis, **characterised in that** at least one of the arms carries a generally arcuate limb provided with latch means, **and in that** the hanger comprises catch means to engage with the latch means, means to effect resilient engagement between the latch

WO 2004/058013

PCT/GB2002/005942

- 2 -

means and the catch means, and release means manually operable to counter the resilient engagement and permit disengagement of the latch means and the catch means.

5 Preferably each of the arms carries a generally arcuate limb provided with latch means engageable by catch means, and the means to effect resilient engagement is common to the catch means associated with both the arcuate limbs.

10 Advantageously the catch means are provided on an elongate arcuate strip constituting the resilient means, and the release means is operable to deflect the strip such that the catch means thereof moves out of engagement of the latch means.

15 Preferably the release means comprises a resiliently depressible pushbutton engageable with a nodule on the strip, depression of pushbutton onto nodule causing the strip to deflect and effect disengagement of catch means with latch means.

Advantageously, the arms protrude from a housing that encloses the toothed arcuate racks, a hook for the hanger being fast with, e.g. provided integrally with, the housing and extending upwardly and outwardly therefrom.

20 In a preferred embodiment the housing comprises a main part moulded of plastics material with axle pins to provide said common axis and adjacent parallel axis, and further comprises a closure plate snap-fit engageable with the main part by engagement means. The closure plate is moulded of plastics material with C-shaped resilient clips or catches to engage the free ends of the axle pins and retain thereon the arms and the
25 pinions. Preferably the said elongate arcuate strip is moulded integrally with the main part of the housing, and the pushbutton is provided at the end of a resilient strip moulded as part of the closure plate.

30 Advantageously one of the latch means and the catch means is formed as a series of ratchet teeth and the other is formed as at least one projection to engage with said ratchet teeth.

WO 2004/058013

PCT/GB2002/005942

- 3 -

Preferably the part of one arm provided with a toothed arcuate rack is an arcuately extending limb that is concentric with and slidable over another arcuately extending limb projecting from the other arm.

5 Brief Description of the Drawings

A preferred embodiment of the invention will now be described by way of examples with reference to the accompanying drawings in which:

- Figure 1 is a perspective exterior view of the foldable clothes hanger according to this invention in folded position,
- 10 Figure 2 is a front view of the interior of the foldable clothes hanger of Fig 1 in a folded position,
- Figure 3 is an internal front view of the foldable clothes hanger of Fig 1 in the open or garment support position,
- Figure 4 is a view of the interior of a generally circular housing provided with the hanger's hook,
- 15 Figure 5 is a perspective view of a double pinion providing a pair of mutually attached gear wheels;
- Figure 6 is a front view of the gear wheels of Fig 5;
- Figure 7 is a perspective view of the left arm of the hanger of Fig 1,
- 20 Figure 8 is a perspective view of the right arm of the hanger of Fig 1.
- Figure 9 is a perspective view of the top main body protection plate provided with pushbutton and a system locking upper lug, and
- Figure 10 is a perspective view of the interior of the main body protection plate.

25 Detailed Description of Example(s) of the Invention

The foldable clothes hanger illustrated in Fig. 1 includes a hook 2 by which the hanger is in use supported (e.g. from a rail), arms 17 and 22 to support shoulder portions of one or more hanging clothes, a circular main body 1 (Fig 4), a protection or cover plate 26 to securely lock the system, and a push button 28 for releasing the arms 17, 22 from their garment support position of Fig 3. Arm 22 is provided with a boss having a bore

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WO 2004/058013

PCT/GB2002/005942

- 4 -

21 therethrough (Fig 7), and arm 17 has a similarly positioned sector-toothed gear wheel 14 with a bore 15 therethrough (Fig 8).

5 The sector-toothed gear wheel 14 engages the smaller diameter gear wheel 24 of the double pinion shown in Figs 5,6. This double pinion has a central bore 25 by which it is mounted pivotally on axle pin 9 and held thereon by the "C" shaped resilient clip or catch 34 (Fig 10). The larger diameter gear wheel 23 of the double pinion engages an arcuate gear track 19 provided on an arcuate limb extension 22a of arm 22. This arcuate limb extension 22a can slide arcuately and concentrically within an arcuate limb extension 17a of arm 17 (see Fig 3). The outer arcuate surface of the limb extension 17a is provided with an arcuate track 13 of ratchet teeth (Fig 8) that can engage co-operating ratchet teeth 5 provided internally of a resilient retention track 3 within the housing's exterior wall 35 (see Fig 4). This retention track 3 is also provided with oppositely directed ratchet teeth 4 which are co-operable by ratchet teeth 13 provided on an arcuate limb 22b extending from arm 22 (see Figs 2,3). A release nodule 6 is provided between ratchet teeth 4,5.

20 With the arm 17, 22 in the folded position of Fig 2, the ratchet teeth 5 and 13 are disengaged and the ratchet teeth 4 and 18 are disengaged. Movement of arms 17,22 is controlled by the double pinion 23,24 which is rotatably mounted on the off centre axle 9 extending through bore 25. The teeth 24,23 of the double pinion engage arcuate gears 14, 19 respectively. A lower spacer block 10 is provided to stop the arms 17,22 coming too close to one another when in the folded position.

25 Fig 3 shows the open or garment support position of the foldable clothes hanger where the garment support arms 17 and 22 have been pushed out and clasped or otherwise retained in that open position. If the left arm 22 is lifted manually to move in a clockwise direction, the arcuate limb having the gear 19 rotates over the gear wheel 23 to enter into a recess or indent 16 in arm 17, and the arcuate limb having ratchet teeth 30 18 moves towards the ratchet toothed track 4. If the right arm 17 is lifted manually to move in an anti-clockwise direction, the sector-toothed gear wheel 14 rotates over the

WO 2004/058013

PCT/GB2002/005942

- 5 -

gear wheel 24 (coaxially under gear wheel 23) and the arcuate limb providing ratchet teeth 13 moves towards the ratchet tooth track 5 and to be retained in position.

5 As best seen in Fig 4, the circular housing 1 from which hook 2 projects has track 3 perpendicular to the surface of the circular housing 1, and concentric with an arcuate upper recess or channel 7. The lower spacer block 10 is provided opposite channel 7 and is likewise integral with housing disc 1. Recesses 11 and 12 provided to each side of block 10 and are engageable by resilient tags 29, 30 provided on the main body protection plate 26. The block 10 and its recesses 11, 12 are designed to keep the system aligned and locked with the main body part protection plate 26 (Fig 10) so that the moving parts are retained in position. This is apparent from Fig 10 which shows the main body protection plate 26 with a system-locking upper lug 32 to enter engagingly into channel 7, a catch 33 to engage the centre axle 8, a catch 34 to engage the off-centre axle 9, and the system-locking lower catch provided by resilient tags 29, 30 that enter into the recesses 11, 12 of the spacer block 10. The dimensions of the main body protection plate 26 and the circular housing 1 providing hook 2 are selected and designed to be suitably commensurate with one another to facilitate system locking.

20 It will be appreciated that the hook 2 is to have the foldable clothes hanger on a rail or similar support. The folded position shown in Fig 1 for the arms 17, 22 enables the user to insert the hanger into the neck of a garment and then bring the arms to the open position or garment support position shown in Fig 3 which allows the user to hang a garment on the now unfolded hanger. The bring the arms from the folded position into the open (or unfolded) position, the arms 17, 22 can be pushed outwards and upwards by the user until the arms 17, 22 come into a ratchet clamped state which can be heard by a clicking sound as the ratchet teeth engage with one another.

25 The garment can be easily released or removed from off the hanger by the user pressing the pushbutton 28. The pushbutton 28 is moulded integrally with the protection plate 26 at the end of an arcuate resilient strip (Figs 9, 10). The pushbutton 28 is positioned above the inwardly projecting release nodule 6 that is moulded integrally with the

WO 2004/058013

PCT/GB2002/005942

- 6 -

arcuate retention track 3 that is provided on an arcuate resilient strip perpendicular to housing disc 1. As the pushbutton 28 is depressed, it engages the nodule 6 to push it, and the track 3 with which it is integral radially outwards (see Fig 2). Such outwards movement of track 3 effects disengagement of the mutually co operating ratchet teeth 4,18 and of the mutually co-operating ratchet teeth 5,13 so that the arms 17,22 can drop down under gravity and/or under the weight of the garment they support so as to adopt the folded position. In this folded position, a garment on the hanger can be removed or the folded hanger can be inserted into the neck of a garment in readiness for return of the hanger to its open or unfolded position.

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It will be appreciated that due to the geared connection between the arms 17 and 22, arcuate motion of one arm in a clockwise or anti-clockwise direction will automatically give rise to arcuate motion of the other arm in respectively an anti-clockwise or clockwise direction.

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It will be appreciated that all the parts mentioned above can readily be moulded of a suitable plastics material.

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It will be appreciated that the above described and illustrated embodiment of the invention can operate to move between folded and unfolded positions even whilst mounted by its hook 2 on a rail.

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It will be noted that the above-described and illustrated embodiment of this invention provides a foldable clothes hanger which, in its folded position, can be easily inserted into the neck of the garment regardless of variations of neck span size and, with minimum effort, the arms of the hanger can then be opened and clasped to hang garments. To remove the garment from the hanger, the pushbutton 28 integrated with the main body cover plate 26 can be pressed by the user to fold the hanger.

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This illustrated foldable clothes hanger has exceptional features of folding and unfolding of arms by precise mechanical movements. Notably it removes the need for

WO 2004/058013

PCT/GB2002/005942

- 7 -

undoing and doing up buttons on the garment in order to insert or remove the hanger.
The neck span size is no longer an issue.

5 It will also be appreciated that the above-described and illustrated embodiment can be modified without departing from the scope of the attended Claims. For example the hook 2 can have the form of a closed eye that in use is threaded onto the end of a rail so that the hanger is retained on the rail and cannot be easily removed from the rail. Clothes can nevertheless still be easily put onto the hangers or taken off the hangers due to the folding and unfolding movements to which the arms 17,22 can be subject.

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Other modifications and embodiments of the invention, which will be readily apparent to those skilled in this art, are to be deemed within the ambit and scope of the invention, and the particular embodiment(s) hereinbefore described may be varied in construction and detail, e.g. interchanging (where appropriate or desired) different
15 features of each, without departing from the scope of the patent monopoly hereby sought.